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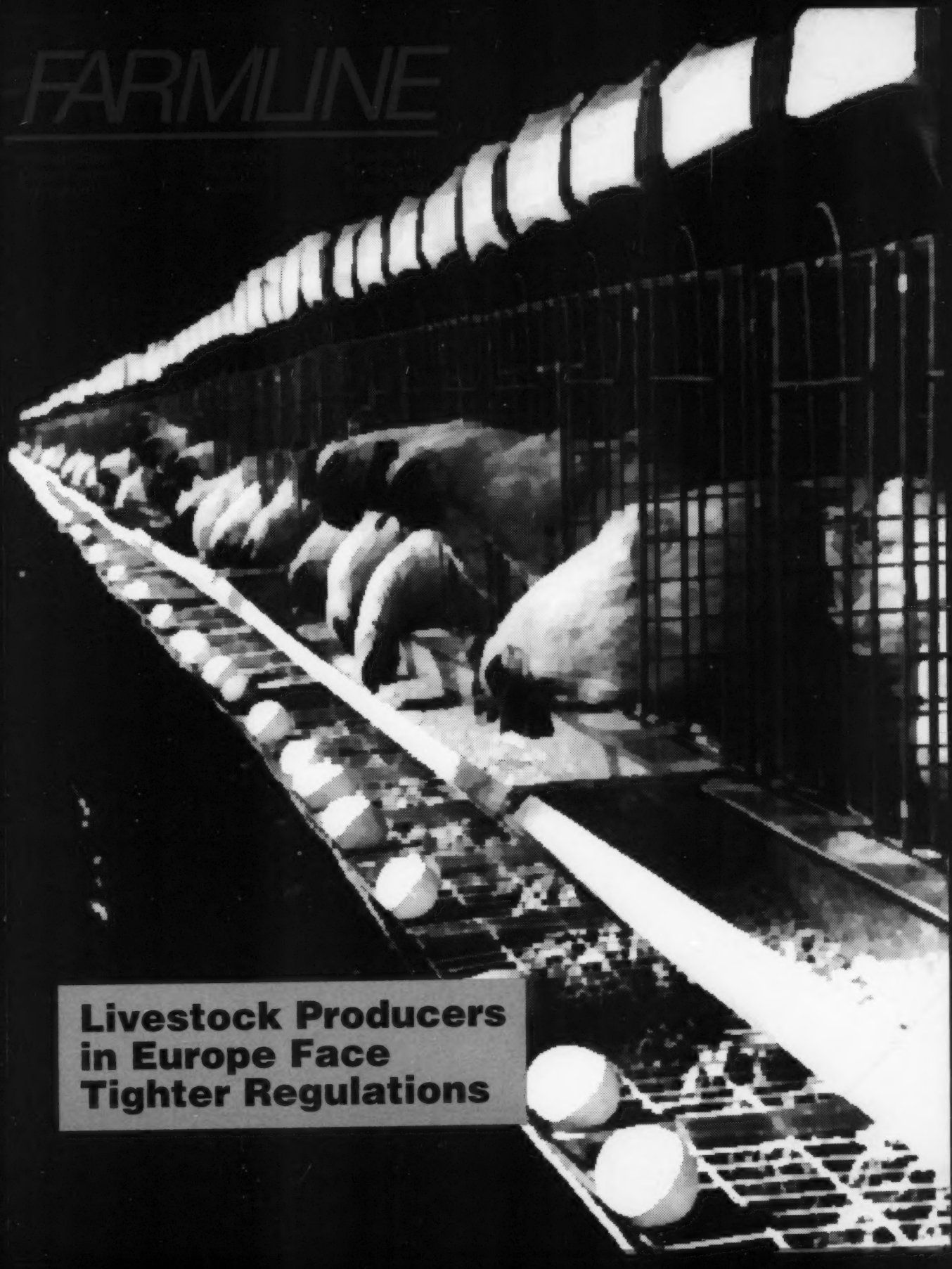

Livestock Producers in Europe Face Tighter Regulations

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FARMLINE (ISSN No. 0270-5672) is published 11 times a year by USDA's Economic Research Service. Send questions, requests, and editorial comments to *FARMLINE*, Room 228, USDA, 1301 New York Avenue NW, Washington, DC 20005-4789.

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PERSPECTIVES

Synthetic bovine somatotropin (bST) remains at the center of the debate over the use of biotechnology in agriculture. bST affects the individual milk producer, the dairy industry, and the consumer in widely different ways, according to Richard Fallert and Don Blayney of USDA's Economic Research Service.

The Food and Drug Administration (FDA) has determined that beef and dairy products from cows treated with synthetic bST are safe for human consumption, and has authorized the sale of milk and meat from cows that receive the hormone in approved research studies. FDA tests to determine bST's impact on animal health are continuing.

When a dairy farmer is thinking about using bST, the economists explain, there are at least four factors to consider: the response of cows to doses of synthetic bST, the milk price, the cost of the hormone, and other costs associated with higher production.

"Herd trials indicate that bST increases milk production by 10 to 20 percent," Blayney and Fallert state. "The actual cost of bST to the producer is unknown, since it has not been approved for commercial sale." The rise in costs (such as for feed and labor) that go along with greater milk production will depend on the amount of increased output.

Because bST doesn't require much capital investment, its adoption could be as advantageous for a well-managed small dairy farm as a large one, the economists say. Therefore the introduction of bST will likely reinforce, but not fundamentally alter, the trend toward fewer and larger dairy farms.

For the dairy industry as a whole, the economic effects of bST will be determined largely by how fast it is adopted and by future agricultural policy. "Under 1991 dairy legislation under consideration before Congress, dairy farms could wind up with production quotas," Fallert explains. "Supply or so-called inventory management programs could hurt producers if they are penalized for producing over a certain amount of milk, whether they use bST or not."

What effect would widespread adoption of bST have on the problem of excess milk supplies, a difficulty the dairy industry faces periodically? Although Fallert and Blayney state that it might exacerbate the problem, they also point out that excess supplies are usually built up in response to income enhancement available through the dairy price support program. They estimate the impact on dairy farm structure and regional concentration of milk production that can be directly attributed to the commercial adoption of bST as minor.

In the meantime, adverse publicity could affect consumer perceptions about the safety of bST and its possible effects on human health. "This issue translates into producer and industry concerns about the possible consequences of bST adoption on the demand for dairy products," the economists conclude.

— Priscilla B. Glynn

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Livestock Producers in Europe Face Tighter Regulations

Several European countries are putting new, tougher restrictions on livestock production because of concerns about water pollution and the treatment of farm animals.

In the United States, too, livestock producers are facing new regulations, though much less strict and far-reaching than those in Europe. Pollution stemming from agriculture tends to be more of a problem in heavily populated areas, of which Western Europe has many.

Two of the main areas of controversy in Europe are cage technology in egg production and disposal of manure from livestock operations.

"Caging of egg layers is being regulated in Western Europe because of animal welfare concerns," says economist Gary Vocke of USDA's Economic Research Service. "Legislated limits on caging put farmers at a competitive disadvantage with countries that don't have such limits."

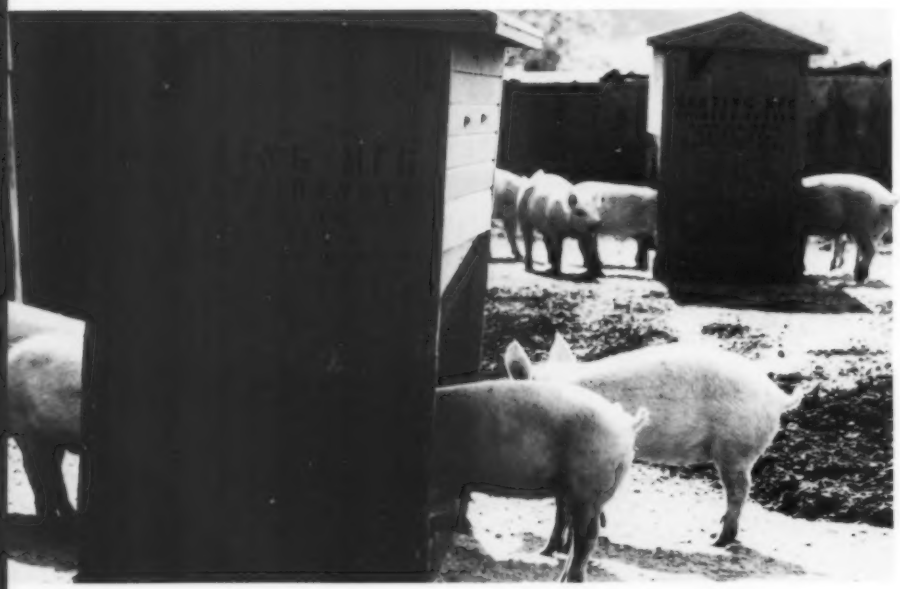
Technological progress shifted egg production from pastures to confinement buildings and cage housing. This trend began in the United States in the 1940's and in Western Europe and elsewhere in the 1950's. By the early 1970's, Western Europe's commercial egg industry had nearly completed its shift to cage housing.

Cage technology in egg production and manure disposal are two main sources of controversy.

In the United Kingdom (UK), as an example, the proportion of layers housed in cages increased from 20 percent in the early 1960's to more than 90 percent by the mid-1970's. In the United States, the proportion today is about 99 percent.

Mechanization of many tasks enables producers to care for much larger flocks. Feeding, watering, and egg collecting can be done automatically. In cages, eggs are cleaner and there is less cannibalism and pecking among the hens. The cage system also alleviates the problem of land becoming infected with disease organisms from chicken droppings. By putting several birds in one cage, capital costs can be further reduced and egg output increased.

But animal welfare groups argued that the restricted movement in small cages constituted cruel treatment of the birds.



Regulations Increase Cage Space

Policymakers in several countries have heeded such arguments and passed laws requiring increased cage space per bird. At least one country has decided to ban cages altogether.

In 1986, the European Community (EC) adopted regulations covering caged layers. The restrictions applied to new cages as of January 1, 1988, and to all cages as of January 1, 1995. The regulations covered total cage space, height of cages, slope of floors, and feeding and watering equipment. At least 450 square centimeters of cage space (an area a little larger than 8 inches by 8 inches) per bird was required.

Several countries, both inside and outside the EC, have adopted their own standards. Switzerland has banned cages for egg layers after next December 31. Sweden and the Netherlands also are considering proposals to ban cages. Sweden and Denmark now require 600 square centimeters of cage space for each hen. The UK has legislation requiring that by 1995, four-bird cages have 450 square centimeters per bird, three-bird cages 550 square centimeters, and one-bird cages 1,000 square centimeters.

"All alternatives to cages raise production costs," Vocke says, "because labor and feed requirements rise and the number of eggs produced per hen declines."

Production costs per egg increase as housing intensity declines and the layers, if outside, are exposed to more weather hazards, disease problems, and predators, the economist continues. Producers say that such hazards represent a less favorable environment for the hens, from a physical welfare standpoint, than being in cages.

U.S. Regulations Getting Stricter, Too

The United States, compared with many European countries, has fewer laws and regulations relating to pollution and animal welfare concerns in livestock production.

"However, all States, the Federal government, and many local governments do have some such regulations," according to a USDA official.

"The two areas with the most regulation concerning humane treatment of farm animals in this country are probably the transportation of livestock and the methods of killing in slaughterhouses," says ERS economist Gary Vocke.

"U.S. farmers have traditionally treated their animals humanely, so problems have been infrequent and pressures for more regulation not so widespread," Vocke says.

He adds that proposals have been made, and debates carried on, regarding other issues, but in few instances have laws and regulations resulted.

Donald D. Bell, poultry specialist at the University of California-Riverside, says that the poultry and egg industries "have been targeted by animal rights activists," who seek regulation of such operations as caging, beak trimming, transportation, feeding, and watering.

He says that some of the changes sought would not constitute improvement in the well-being of the birds.

"Free-range or 'natural' environments, which are difficult to control, are likely to contain such hazards for poultry as adverse weather, predators, unsanitary conditions, more feed and water contamination, and higher incidence of disease," Bell says.

"The farmer has perfected his housing and equipment to protect his flock from these conditions and to guarantee their welfare," he adds. Eggs are cleaner in a cage environment, as well.

"Manure management represents one of our more critical issues and commonly dictates the level of community tolerance for the poultry industry," Bell says.

More than 10 million tons of manure are produced annually by the U.S. poultry industry. Some of the manure is sold at a profit and some is disposed of at a net loss.

"When we start to consider manure a product instead of waste, and to promote its value, the problem could disappear," Bell says.

Bell notes that urban encroachment has also been a major problem for egg producers in the United States. "Government restrictions have created difficulties for poultry producers in a number of areas," he says. Such restrictions include licensing, fees, and inspections by local governments, Bell says.

Some U.S. livestock producers, in various parts of the country, moved their operations when urban development began to push too close.

"Some areas now have manure disposal problems because of the practical limit on how much can be spread on a particular piece of ground," Bell says. He adds that a few local pollution agencies in the United States are looking at systems in Europe that have addressed this problem.

In Florida, the State legislature passed a law 2 years ago requiring about 50 large dairies north of Lake

Okeechobee to capture manure and waste water to prevent pollution of the lake. State officials say that waste water from farms has raised the levels of phosphorus in the lake to more than double the natural levels, resulting in unwanted plant species crowding out others and upsetting the ecology of the region.

To address the matter of treatment of livestock, the California Cattlemen's Association, for example, has devised a code of ethics that sets standards for livestock health and safety, managing livestock humanely, consulting with veterinarians on health care, using approved livestock health care products according to label directions, and conserving natural resources by proper management of land, water, air, and wildlife.

In North Dakota, a group of livestock organizations is developing standards for animal husbandry, to cover not only farm animals but also animals in zoos and competitive exhibitions, and pets.

Waste Disposal a Problem

Manure disposal is another concern of egg producers, but it can be even more of a problem in other types of intensive animal agriculture.

In some locations in Europe, there is no convenient way to dispose of surplus manure, which can be a pollution threat to public water supplies.

Reducing the concentration of livestock—which has been tried in some areas—can cut the risk of pollution, but it lowers agricultural income. Some governments, including those of the Netherlands, Denmark, and the UK, are forcing changes in manure management and cropping practices. Such changes affect a large proportion of the farm sectors in certain countries.

"In many West European nations, livestock production accounts for more than half of the total value of agricultural output," Vocke says.

As the livestock industry has shifted since the 1960's to confinement production methods, more livestock are being concentrated in smaller areas. Total livestock numbers also have increased in Europe, to meet rising demand for meat, dairy, egg, and other livestock products.

In the southern part of the Netherlands, the intensity of livestock production is several times the national average. Total manure production for the entire country is estimated at 95 million tons, of which 15 million is surplus (cannot be used or disposed of) in the regions where it is produced. About 70 percent of nitrogen-related acid rain in the Netherlands is attributed to agriculture, Vocke says.

In Belgium, the situation is similar, with total manure production estimated at 41 million tons, of which 8 million is surplus.

Lower Saxony, in the western part of Germany, and the Po Valley in Italy are among other areas with nitrogen pollution problems in water supplies because of a high density of livestock farms.

In Denmark, agriculture is considered responsible for the high levels of nitrogen in many lakes and in much of the country's marine waters, Vocke says. Uncontrolled spreading of swine manure causes most of the agricultural pollution. Phosphorus pollution is also a problem, but is mostly attributed to urban waste water.

In France, water pollution problems have been increasing in the province of Brittany, which has 40 percent of the country's intensive livestock operations, including half of the swine production. In recent years, nitrate levels above the EC standard have been occurring in additional regions of Brittany. The UK also has high concentrations of nitrates in some public water supplies.

Nitrates can enter surface or ground water supplies not only directly from the soil. Nitrogen also is easily converted into gases, which escape into the atmosphere. From there the nitrogen can return to earth in acid rain and be leached into ground water. Nitrogen pollution of public water supplies is a health concern because of the theoretical risk of stomach cancer and blue baby syndrome, a respiratory ailment. Blue baby syndrome occurs as a baby's blood takes up nitrogen instead of oxygen, causing respiratory failure.

The ailment is rare and occurs only in babies under 3 months of age. If it is known that the water has a high nitrate concentration, parents can provide denitrified water to babies under 3 months old. In the UK, there have been 14 cases of blue baby syndrome in the last 35 years, with the most recent occurring nearly 20 years ago.

Nitrogen pollution is also an ecological concern. Acid rain can cause surface water to become enriched with too much nitrogen, which causes excessive plant and algae growth. This in turn deprives other plants and fish of the oxygen, light, and space they need.

Some Possible Solutions

"There are a number of ways to provide low-nitrate water," Vocke says. "Each has different costs, paid by different groups."

Options include several ways of reducing nitrogen concentration after water has already become polluted. These methods include blending high-nitrate water with low-nitrate water or using chemicals for denitrification. The latter method is more expensive.

Nitrogen pollution also can be controlled or limited during the process of applying manure to the land. The options at this stage include limiting the quantity of manure applied, incorporating it into the soil immediately, applying it only in spring and summer, and growing fall crops. Use of manufactured fertilizer also can be limited.

Manure adds considerable nitrogen to the land, because most of the nutrients in livestock feed end up in the manure. For example, about 70 percent of the nitrogen in feed consumed by dairy cows, swine, and laying hens is excreted.

Immediately incorporating manure into the soil reduces nitrogen losses to the atmosphere and also cuts the risk of surface-water runoff carrying manure into waterways.

Nitrate leaching occurs mainly in the fall and winter. Farmers can reduce this seasonal problem by growing fall crops, which will take up nitrogen and water, thus tending to counteract leaching.

A UK research project on one specific watershed found that the lowest cost pollution-control option there involved a combination of several actions: controlling land use, controlling the amount of manure and fertilizer applied, and blending high-nitrate and low-nitrate water in the public water systems.

A more expensive option for this particular watershed would involve converting those croplands most critical to water quality to forests. Agriculture would bear more of the cost under that alternative.

"Livestock concentrations in Denmark and the UK, though not in the Netherlands, are low enough to allow safe land disposal of manure if appropriate farming practices are used," Vocke says.

In the Netherlands, pig and poultry farmers have been forbidden since 1984 from increasing the size of their operations. This regulation was aimed at stopping the increase in manure surpluses. New laws are putting stricter limits on the amount of manure that can be spread per hectare, according to soil type and crops. These laws will be fully implemented by the year 2000.

Some Dutch poultry companies have been moving their operations to Belgium, which does not have the same level of restrictions.

The Dutch have a unique program of transporting manure to different regions of the country, Vocke says. The government provides a transport subsidy for shipping the manure.

The Netherlands is experimenting with exporting manure, after water is removed and the remaining solids are pelletized. The government is subsidizing a pilot plant, which would not be feasible without the subsidy, Vocke says.

The Dutch government also controls the use of land near water wells. Almost 5 percent of the country's land area is in this category. Water authorities have purchased land near some wellheads. And water companies compensate farmers for changing their farming practices on land farther from wellheads.

The government will review the wellhead protection program in 1994. If it has not been effective, farmers near wellheads may be required to reduce livestock numbers.

The UK has a Code of Good Agricultural Practice for the Protection of Water. The code is voluntary, but failure to comply can be taken into account in any legal proceedings.

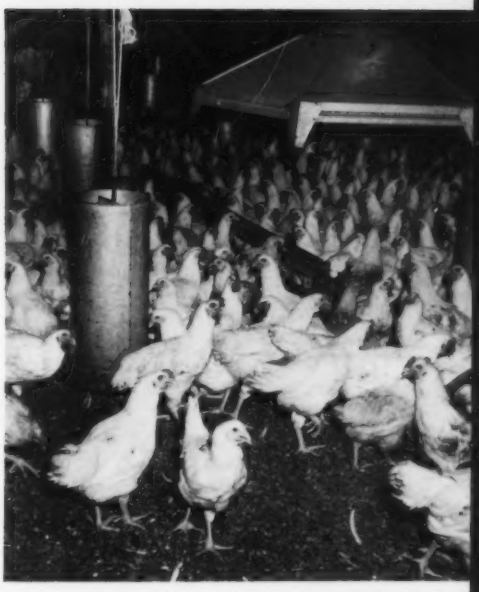
The code states that the spreading of manure should not exceed 250 kilograms per hectare (223 pounds per acre) per year. The code also states that manure should not be placed on cropland after harvest if the land is to be bare over the winter.

To help farmers meet the guidelines, the government provides grants that cover half the cost of constructing facilities for storage of manure during the fall and winter.

The UK has also begun several 5-year demonstration projects in what are considered "nitrate-sensitive" areas. These projects involve compensating farmers for certain efforts to control manure and fertilizer use and for converting cropland to unfertilized and ungrazed grass or trees.

In Denmark, the law requires farmers to prepare fertilization plans if either manure or manufactured fertilizers are used. Danish law also requires that 65 percent of the cropland on each farm must have fall vegetation to reduce the risk of nitrate leaching. The government verifies that farmers are meeting this requirement.

Manure disposal also is regulated in Denmark. The law establishes maximum livestock concentrations per hectare and if a farm exceeds the limit, surplus manure must be applied on other farms. However, there have been problems finding other farms to take surplus manure.



The law also requires that manure spread on bare fields be plowed into the soil within 12 hours and that manure not be spread on frozen or snow-covered land. Farms are required to have storage facilities to handle 9 months of manure production. The government assists farmers with grants to cover up to 40 percent of the cost of constructing the storage facilities.

"European livestock production is at a crossroads," Vocke says. "The question remains whether current environmental strategies, aimed at avoiding cutting livestock density, will be adequate to solve the problem of adverse environmental consequences of modern livestock confinement technology." □

[Based primarily on information provided by economist Gary Vocke, Agriculture and Trade Analysis Division, Economic Research Service.]

Kuwait Offers New Farm Export Opportunities

Help for Kuwait's war-ravaged economy is coming from America's heartland—and more may be on the way from other U.S. agricultural producers who are finding new markets there.

In the wake of the devastating Gulf War earlier this year, Kuwaiti officials are busy buying food for tens of thousands of returning Kuwaiti citizens—and for the many thousands who remained in the country during the 7-month Iraqi occupation.

Before the August 2, 1990, occupation, Kuwait had a population of about 2 million, including 800,000 Kuwaitis. The current population is still less than half the July 1990 level. Traditionally, many Kuwaitis spend the summer in other countries, and many are still in Saudi Arabia and Egypt. But officials are preparing for the permanent return home of most Kuwaitis by autumn of this year.

"It now appears that a strong import recovery will occur, with 1991 agricultural imports rebounding from the low level of late 1990," says economist John Parker of USDA's Economic Research Service. "By late 1991, substantial stock rebuilding should begin, and efforts will be under way to establish new poultry farms and dairies, possibly in the far north near the Iraqi border, away from the problems left by the war in the south."

"The U.S. share of Kuwaiti imports should rise in 1992."

Boosting Market Share

"The U.S. share of Kuwait's agricultural imports, including tobacco products, ranged from 5 to 10 percent from 1988 to 1990, but should rise in 1992," Parker notes. "Corn was often the leading U.S. farm export to Kuwait, but the country was also a significant market for corn oil, poultry meat, apples, vegetable preparations, and snack foods."

In 1989, U.S. agricultural exports to Kuwait surged 50 percent to $59 million. A resumption of purchases of U.S. wheat (54,000 tons) and greater sales of high-value products and animal feed contributed to the increase. Before the Iraqi invasion last August, U.S. agricultural exports to Kuwait in 1990 had reached $23 million.

Of course, the Kuwaiti people are also depending on other food sources.

"The European Community (EC) provided about a fourth of Kuwait's agricultural imports from 1988 to 1990, and is expected to again be the leading supplier," says Parker. "Turkey was the second major supplier of food products to Kuwait before the war and will likely regain that position."

He adds that Saudi Arabia has recently shipped large amounts of wheat flour, vegetables, and canned food to Kuwait, and Australia sent 15,000 live sheep in April.

Overall, Kuwait's agricultural imports increased about 20 percent over 1988 to reach $1.2 billion in 1989, and continued to rise in early 1990. Moreover, imports of feed grains were unusually large in 1989 in an effort to expand poultry enterprises and dairies.

"This meant that the warehouses were flush with cereals and a wide assortment of canned goods on August 2, 1990, when Iraq occupied Kuwait," says Parker. "A large part of that supply was carried to Iraqi cities. Also, Kuwait had very large stocks of barley from its imports of more than 300,000 tons in 1989."

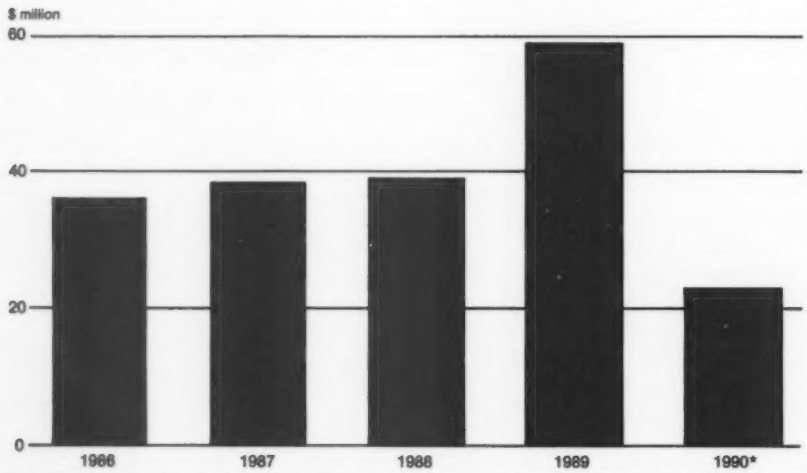
Import Dependence High

Kuwait depends largely on imported foodstuffs to meet its consumption needs. In 1989, for example, the country imported 96 percent of its food supply.

"Domestic production provided a large part of the supply of shrimp, dates, tomatoes, cucumbers, and greenhouse vegetables," says Parker. "The average diet in Kuwait contains nearly 3,500 calories per day, one of the highest in the world, with a greater per capita consumption of livestock products than any other Arab country."

Not surprisingly, then, Kuwait was the most open market for imported food in the Middle East. It allowed imports of most food items

U.S. Agricultural Exports to Kuwait Peaked at $59.3 Million in 1989, Then Dropped to $23.3 Million in 1990



*Export figures are for only part of the year, reflecting the suspension of imports following Iraq's invasion and occupation of Kuwait on August 2.

to enter duty-free. With the exception of poultry products, no domestic agricultural investments were considered worth protecting from foreign suppliers.

"The EC has been Kuwait's leading source of agricultural imports, averaging about $250 million annually from 1987 to 1989," says Parker.

The EC share of Kuwait's imports of dozens of commodities increased in the late 1980's, especially for livestock products. This may have been prompted by the quality of EC goods and by the attractiveness of export restitution payments which provided lower prices and delivery at a lower unit cost than most other suppliers.

The EC moved into the top spot as Kuwait's major source of imported beef, frozen poultry, barley, candy, tomato paste, baby food, and various canned foods. Before that, Australia had been a major beef and barley supplier, Brazil a large frozen poultry supplier, Turkey a major source of tomato paste, and East Asia an important source of candy and processed food.

"In contrast to the EC dominance of high-value products, bulk items made up most of the value of U.S. shipments," says Parker. "Corn has been the best selling item. U.S. exports have also included wheat, barley, soybeans, soybean meal, corn oil, poultry meat, fresh fruit, pulses, and vegetable preparations."

Increased sales of EC and Turkish products in early 1990 prevented further gains in U.S. sales.

Meeting Special Needs

"Kuwait could become a larger market for U.S. exporters who can meet the special needs of Kuwaiti buyers," says Parker. "For example, sales of U.S. frozen poultry and eggs could increase if larger shipments of these commodities were sent there by lowering unit prices and transportation costs. Arrangements which pool orders for Kuwait with other Gulf markets for commodities requiring refrigerated ships have helped boost sales in the past, especially for poultry meat, eggs, and fresh fruit."

In addition, he says, items available in the United States at bargain prices should be attractive to Kuwaiti buyers, including commodities like carrots and sweet potatoes. Kuwaiti importers and wholesalers watch export prices closely and are price-responsive buyers.

Demand for imported canned seafood in Kuwait is likely to grow significantly because the war and oil spill disrupted the flourishing shrimp industry.

Kuwait was one of the top 10 markets for U.S. cigarettes in the 1980's, and trade has resumed. Kuwait is also likely to be a substantial market for U.S. wood and building materials as it rebuilds structures destroyed during the war and redevelops its residential areas.

The United States will also be able to help Kuwait develop its postwar economy in other ways, including technical assistance on agricultural and related matters.

"Kuwait is likely to eventually plan for more orchards and vineyards in order to develop a green zone around Kuwait City and from Jafra to Awalli in the north," says Parker. "While discussions about agricultural developments were held in the 1980's, very little happened. The events of the past year made planners in Kuwait realize that a higher priority must be given to streamlining food supplies and to developing local agriculture. While the high cost of irrigation water will keep production costs above imports, the environmental concerns and efforts to use urban waste water for agriculture favor new orchard development."

Certainly, new agricultural investments are not expected to make even a small dent in Kuwait's food supply, and imports will continue to comprise more than 95 percent of its food needs. □

[Based largely on information provided by economist John Parker, Agriculture and Trade Analysis Division, Economic Research Service.]

India's Agriculture Shows Signs of Change

Once a major recipient of food aid from other nations, India has been a net exporter of agricultural products since the late 1970's.

With a population of around 866 million, India's food needs are considerable. Indians consume over 155 million tons of cereals each year—roughly 397 pounds per person. This figure can be compared with the per capita consumption rates of India's neighbors—342 pounds in Bangladesh, 379 in Nepal, and 372 in Pakistan.

Agriculture plays a key role in India's economy, accounting for one-third of its gross domestic product and 20 percent of its merchandise export earnings. Tea, coffee, spices, oilcakes, cashews, and other high-value items make up most of the country's farm exports. India's agriculture is not highly mechanized, and 67 percent of its 284.4 million workers make their living from this sector.

India has made some big agricultural production gains in recent decades, ex-

Imports of cereal grains have declined steadily since the 1960's.

plains economist Rip Landes of USDA's Economic Research Service. The country has a land area of 1.23 million square miles (about one-third the size of the United States), 55 percent of which is arable.

"India's agricultural policy has had two major goals: achieving self-sufficiency in cereals, and maintaining adequate food supplies at prices low-income consumers can afford," Landes observes. For the major food commodities, Government policy has consisted of rigid control of foreign trade, administered pricing of imports, and selling a portion of domestic supplies at subsidized prices.

The Government provides price incentives to stimulate the production of commodities, and has invested heavily in irrigation and other basic facilities to support the food grain sector.

But Government policies alone cannot determine the success or failure of a country's agriculture in any given year. The vagaries of weather also play a part, and good harvests in India depend heavily on the monsoon (rain-bearing winds).

Food Imports Are Declining

India was the seventh-largest importer of farm products among developing countries from 1986 through 1988, with purchases totaling $1.7 billion—mostly in the form of edible oils, cereals, and pulses (beans and peas). However, the total value of U.S. agricultural exports to India dropped from $352.1 million for 1979-81 to $215 million for 1986-88.

Edible oils, used primarily in cooking, have replaced cereals as India's main farm product import. India has been importing steadily declining quantities of cereals since the mid-1960's, and it now imports only intermittently to ensure adequate buffer stocks after poor monsoons.

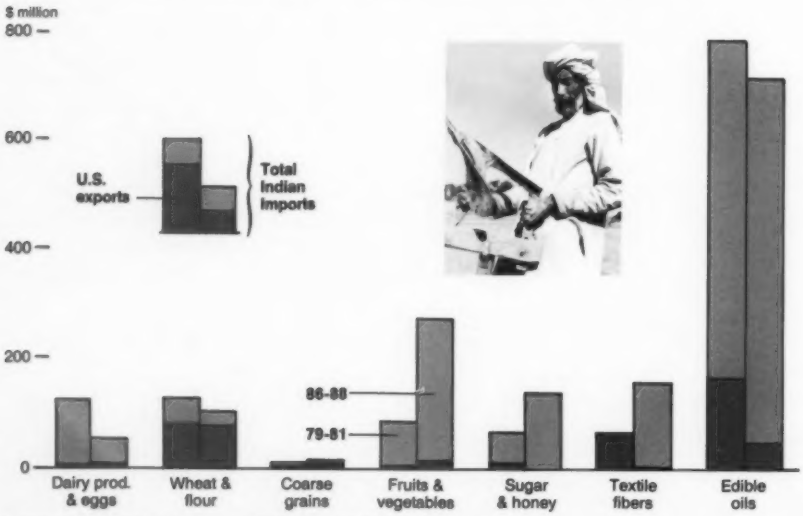
India's northern states produce the bulk of its wheat and rice surpluses. However, economist Kim Hjort of ERS points out that rice is grown in many other parts of the country as well.

The Nation's total grain production reached a record 155 million tons in trade year 1989/90. "It was the second consecutive year in which India harvested a good crop, and substantially improved the country's food security reserves," Hjort observes.

And 1990/91 is expected to be another year of record or near-record production of food grains. "Rainfall during the 1990 monsoon was close to normal over most of the country, higher support prices and Government procurement have sustained producer incentives, and supplies of fertilizer, seeds, and other inputs were reportedly adequate," Hjort states.

In 1990/91, it is estimated that India will produce about 75 million tons of rice, nearly

India Represents a Contracting Market for Some U.S. Agricultural Products



Source: UN Food and Agriculture Organization data and UN trade data.

50 million of wheat, and 35 million of coarse grains. The Government has sought export markets for up to 2 million tons of surplus wheat stocks.

Financial Problems Loom

But Landes notes that although India's performance in the agricultural export arena has improved somewhat, its trade and budget deficits remain large. Since the late 1980's, servicing its foreign debt has emerged as a major concern for India's policymakers.

The problem became acute in 1990, due to the need to repay obligations to the International Monetary Fund, more difficult terms for concessional borrowing, and increased commercial borrowing.

Landes points out that India is now having to rely more on foreign borrowing. In addition, it is proving difficult to reshape India's incentive structure into a more export-oriented system.

Declining remittances from Indians working in the Middle East, an important source of foreign exchange since the early 1980's, are further complicating the financial situation. The lower remittances are hindering India's ability to repay its foreign debt.

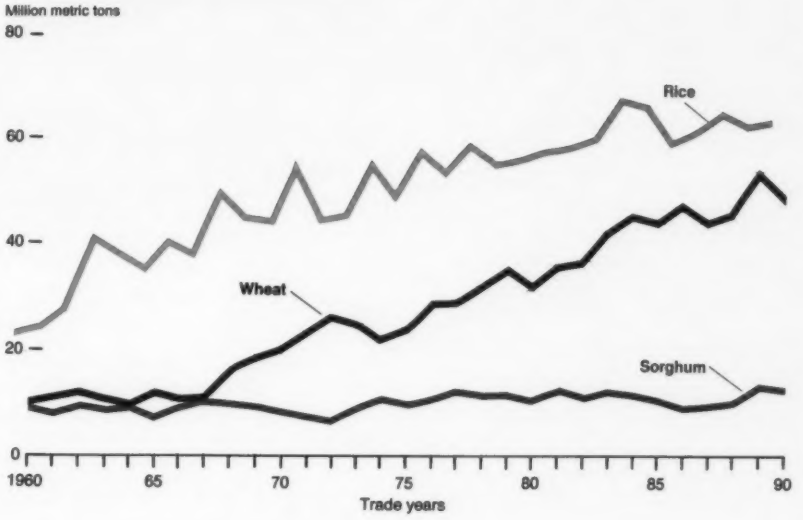
The Nation's trade deficit also widened over the past decade because of rising costs for petroleum, India's most costly import, and low production of and sluggish demand for Indian exports.

Changing Farm Policy

But the last few years have provided some indications that India is altering its traditional policy of subsidizing consumers and taxing producers. In 1989, the combination of a string of poor harvests and strong domestic demand sharply reduced food grain stocks. "Nevertheless, the Government held imports and stocks at low levels, permitting cereal prices to rise—instead of importing large quantities of grain, as it had in the past," Landes notes.

In 1989 and 1990, the Government restricted edible oil imports and began pursuing price and allocation policies to bolster supply and manage demand. Despite record-setting production, the Government has kept edible oil prices high by curbing imports and instituting a floor price that prevents them from declining—even in years when harvests are good.

India's Grain Production Has Shown Steady Gains Over the Last Three Decades



The financial constraints now facing India will likely persist into the mid-1990's. "It will take time for India's traditionally inward-looking economy to make enough money from exports to settle its foreign debt," Landes remarks. He anticipates that the Government will take a three-pronged approach to managing the Nation's food import bill—by strengthening farm incentives, allowing rising prices to control demand, and continuing to limit imports.

Permitting prices to go up would reduce price distortions in the food grain sector (where domestic prices are generally lower than world prices), but would exacerbate distortions in the edible oils market (where India's domestic prices are already three times as high as world prices).

"India will probably be able to supply its own food needs during this decade," Hjort observes. Food security stocks have now been sufficiently built up to compensate for any moderate production shortfalls that may occur over the next couple of years. However, it is possible that growing demand and financial constraints could make food aid necessary if the country experiences severe or successive production declines.

Foreign exchange reserves remain well below target levels, and inflation is becoming more of a problem throughout the economy—factors that may contribute to volatility in food grain prices. "In addition, higher world cereal prices that could result from reduced subsidies in developed countries, or another oil price shock that would reverberate throughout the Nation's economy, could restrict India's ability to import cereals," Hjort cautions. □

[Based primarily on information provided by economists Rip Landes and Kim Hjort, Agriculture and Trade Analysis Division, Economic Research Service.]

New Checkoff Program Promotes Soybean Products

A new shortening bearing the SoyMark, a logo of the American Soybean Association (ASA), is now being sold to consumers in California. Such promotions may soon be funded under the soybean checkoff legislation in the 1990 farm bill. The recent effort results from years of work by the ASA, as well as 29 State soybean programs that began with North Carolina in 1966.

Last December the new shortening appeared on shelves of 4,000 stores of Certified Grocers of California, Ltd., under their "Springfield" label. Certified Grocers has exclusive rights for 1 year. After that the shortening could be available nationwide.

The SoyMark—consisting of the opening leaves of a soybean plant in yellow against a round-cornered green square—was developed by the ASA 2 years ago to indicate soy oil as an ingredient in a product. More than 100 other products also bear the symbol, which is used to increase consumer recognition of soybeans.

The national checkoff program will emphasize exports.

PRINTED WITH SOY INK™

While the recent law does not ensure that ASA will carry out the promotion program, the association hopes, with its expertise, to win contracts from the new United Soybean Board provided for under the farm bill. The ASA has a membership of 33,000, and the country has 450,000 soybean farmers.

According to a recent national survey cited by Buck McCann, president of the ASA, only 15 percent of consumers were aware they consumed soy oil.

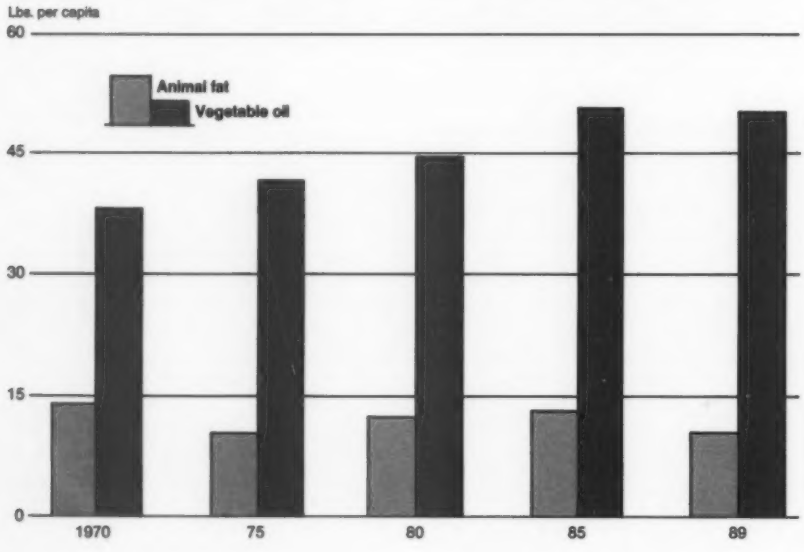
McCann emphasizes that the new shortening is a departure from earlier ones because it contains 100 percent soy oil, rather than a mixture, such as 80 percent soybean oil blended with 20 percent cottonseed or palm oil. The latter oils were eliminated as part of a marketing strategy to emphasize an oil consumers perceived as more healthful, McCann says. The new shortening also is without additives, another reason for its being marketed initially in health-conscious California.

Soybeans are one of the Nation's principal crops, earning $10.93 billion for farmers in 1990, compared with $13.62 billion for corn and $6.84 billion for wheat. Harvested acreage of soybeans totaled 56.5 million in 1990, compared with 67.0 million for corn and 69.4 million for wheat.

The Soybean Promotion Research and Consumer Information Act, as it is officially labeled in the farm bill, is known to producers as the Soybean Promotion and Research Checkoff (SPARC). "Basically, *checkoff* refers to assessment," explains Ralph Tapp, chief of the Marketing Programs Branch in the Livestock and Seed Division of USDA's Agricultural Marketing Service. "It means farmers are willing to have some part of their receipts checked off or set aside for promotion."

SPARC provides for 50 cents out of every $100 of farmers' soybean sales to be checked off to fund promotion and research programs, with the funding shared equally by State soybean organizations and the new United Soybean Board. The Board will run the program, seeking to develop new uses for soybeans—such as the new shortening or even printing ink—and to maintain and expand domestic and foreign markets. Farmers who don't want to participate can request refunds.

Americans Are Consuming More Vegetable Oil and Less Animal Fat



Soybean Board Joins Widespread Farm Sector Effort

The Soybean Promotion and Research Checkoff (SPARC) will be administered by the United Soybean Board. The 63-member Board will consist of soybean farmers representing the 29 major producing States, plus regions with limited production.

Two farmers for each position are nominated by the States' soybean boards, which function as promotion entities. The Secretary of Agriculture will appoint one-third of the selected candidates to 1-year terms, one-third to 2-year terms, and one-third to 3-year terms. In each subsequent year, the Secretary will appoint one-third of all Board members for 3-year terms.

The Board will contract for services from organizations engaged in soybean research and promotion, such as the American Soybean Association. The Board will be appointed sometime this summer following publication of the Soybean Promotion and Research Order. Assessments are expected to begin shortly afterward, consisting of 50 cents out of every $100 of farmers' soybean sales. Purchasers of soybeans must collect the money and forward it to a State board or to the national board if no State board exists. The checkoff should raise $50 million a year, with half going to State promotions.

The Act requires USDA to conduct a vote among soybean producers after the program has been in effect 18-36 months to determine if they want the program to continue. The Act also provides for additional producer voting on whether refunds should continue.

"Checkoffs are initiated when a commodity group feels they need to promote their product, often to deal with competition," says Ralph Tapp, chief of the Marketing Programs Branch in the Livestock and Seed Division of USDA's Agricultural Marketing Service. Besides soybeans, checkoffs for limes, mushrooms, and pecans were authorized in the recent farm bill. These checkoffs were expected to raise $2 million, $6.7 million, and $10 million, respectively.

Funds raised through checkoffs in the year ending in July 1990 totaled: $75 million for dairy, $45 million for beef, $27 million for pork, $25 million for cotton, $25 million for soybeans (State programs), $6 million for wool, $5 million for potatoes, $4 million for eggs, $2 million for honey, and $900,000 for watermelons.

Usually, farmers or their organizations initiate a checkoff, petitioning Congress for enabling legislation. For example, the national soybean checkoff was requested by ASA and State organizations. The first promotion program funded by farmers was for Florida oranges more than 50 years ago. The National Wool Act of 1954 provided for the first individually legislated commodity promotion program. Over the years, more commodities were added, and today there are more than 350 programs covering about 80 commodities.

Unlike other checkoffs, the new soybean program will emphasize exports heavily, says Tapp. Both ASA's McCann and Roger Hoskin, an economist with USDA's Economic Research Service, cite declines in 1990 in U.S. exports of soybeans, meal, and oil. Hoskin says the decline is only a stage in a longer but slower growth period for this crop, which extends from the 1950's.

Until 1979, he says, farmers planted as many acres as possible in soybeans. For farmers in the Southeastern United States in particular, this was on marginal land, where the yield was less and the weather unreliable. The overplanted land, especially in Arkansas, Georgia, and Alabama, resulted in high costs of production and, eventually, slower sales abroad. "What we gained in the 1970's we lost in the 1980's," Hoskin notes. "But the worst is over. Acreage will probably stabilize near present levels."

The ASA reports that in the last 7 years, U.S. soybean farmers lost more than $2 billion in annual revenue to competitors who took over export markets equal to the entire production of Iowa. At the same time, soybean production in South America doubled.

Hoskin notes that the Brazilian government subsidized the processing of soybeans to favor exports of oil and meal. Their land and weather were better in some parts than that of some areas of the United States.

The peak years for U.S. soybean exports were 1981/82 and 1982/83, when more than 900 million bushels were exported each year. The United States led the world market with 86 percent of the total soybean trade in 1982/83. By 1990, however, our share of the market had diminished to 59.2 percent, according to Hoskin.

The U.S. share of the soybean meal market declined more than that for beans, Hoskin says. In 1981/82, the United States sold 30 percent of the meal traded on the world

market. By 1990, that figure had declined to 17.5 percent, as we fell behind Brazil and Argentina and remained even with the European Community.

Hoskin notes that the U.S. share of soybean oil exports also has declined. In the late 1970's and early 1980's, we exported more than 2.5 billion pounds of soy oil annually. In 1990, we exported only about 1.3 billion pounds.

"We want to turn around these figures on losses in soybean exports," says McCann. "And the Soviet Union affords us a tremendous opportunity. They really need additional protein. I can't see increasing our per capita protein consumption. We are forced to look at international markets."

He also observes that the Soviet Union would be a good market for soymeal as a protein feed for livestock. That country lacks adequate crushing facilities.

"Unlike the image of soybeans in this country, the image of our soybeans abroad

Some Printers Switching to Soy-Based Ink

Using soy- rather than petroleum-based ink benefits the environment in three major ways, says Roger Telschow, president of Ecoprint, a 10-person printing firm in Silver Spring, MD: (1) it is nonvolatile, which means it will not evaporate and release toxic chemicals, (2) it is a renewable resource, unlike petroleum, and (3) it washes out of paper easily when it is recycled, unlike petroleum-based inks.

Telschow has been in business for 13 years and has been using a nearly 100 percent petroleum-free ink, made from soybeans, for 6 months. The use of soy ink in a printing process reduces the emission of toxic vapors that can accumulate in the lower atmosphere. On the other hand, printing with petroleum-based inks can lead to the release of volatile organic compounds, a chief cause of air pollution and harm to people with lung diseases.

The U.S. Department of Commerce estimates that more than 1.8 billion pounds of ink are used annually in the United States. Most inks contain 30-50 percent petroleum compounds.

"The use of soy inks will help the printing industry meet the standards of the Clean Air Act," Telschow says, referring to the Federal Clean Air Act Amendments of 1990, which strictly limit the amount of volatile organic compounds that can be emitted by a manufacturer each year.

"Soybean inks disperse more readily and are a real aid to the de- inking process," says Jobe Morrison, president and engineer with the Miami Mill division of the Cross Pointe Paper Corporation in West Carrollton, OH, a manufacturer of recycled paper since 1915.

Soy-based inks have been produced by most of the major ink manufacturers within the past 5 years, according to Telschow. "Soybean inks have made the biggest inroads in color inks," he adds, referring to *USA Today*. "Soybean inks tend to be more transparent than petroleum-based inks, and thus show color better." Currently, black soybean ink for newspaper printing is not cost-competitive, according to Wilson Cunningham, vice president of technical research for the American Newspaper Publishers Association (ANPA).

The ANPA members, representing larger firms, use 40 million pounds of soy ink a year. Their consumption, combined with that of other newspapers and commercial printers, requires 5-10 million bushels of soybeans yearly. If all printers converted to 100 percent soy ink, the potential could be about 100 million bushels, according to the American Soybean Association.

Roger Telchow, president of Ecoprint, holds a can of soy ink.

Ten States—Illinois, Minnesota, Missouri, Ohio, South Dakota, Wisconsin, South Carolina, New Jersey, Iowa, and Arkansas—have legislation passed or pending that requires use of soy ink on all printing jobs contracted by the State.

Methods for making ink using natural oils were known as early as 2500 B.C., when the Chinese and Egyptians made inks from such things as bark, berries, linseed oil, and soot.

is much better," McCann adds. "We have already spent much time in promoting exports. Soybean farmers realize they can produce so much more than Americans consume."

Today Americans consume about 6 million more pounds of fats and oils annually than they did 20 years ago, and soy oil continues to dominate the market. In recent years, however, consumption of edible oils has fallen. Analysts are unsure of the reason, except that Americans may be becoming more weight- and health-conscious.

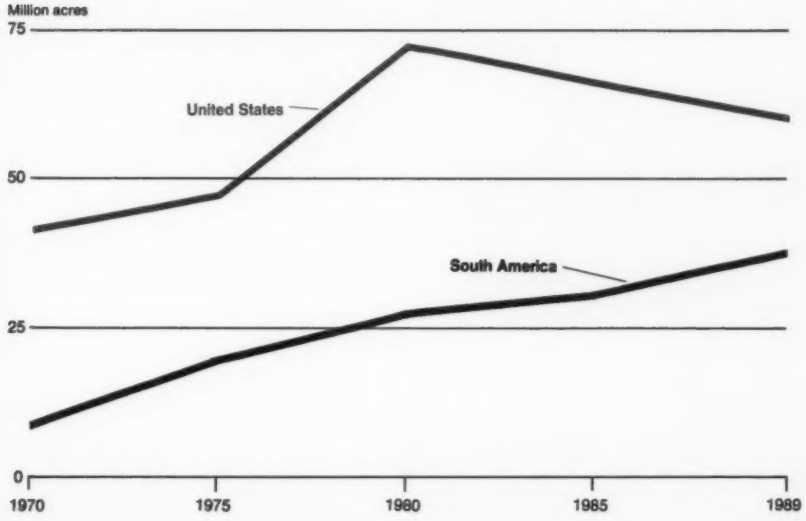
However, Hoskin believes the domestic market for soy oil will remain good. "In 1990, we consumed 18 billion pounds of edible oils, of which soybean oil made up 12 billion pounds. Compare this to the mere 297 million pounds of palm oil consumed in the United States in 1990. I can't see any other oil supplanting soybean oil. Fifty years from now our major oil will still be soybean oil, although we may consume less per capita."

Nor does McCann seem concerned about foreign competition in the U.S. domestic market. "Our product is fine and deserves to be rewarded in the marketplace. Our work will consist of further enhancing the product in the consumers' eyes," he says.

Accordingly, the ASA persuaded Hardee's to adopt soy oil in 1988, the first hamburger fast-food restaurant chain to make the switch to an oil low in saturated fats. □

[Based primarily on information provided by economist Roger Hoskin, Commodity Economics Division, Economic Research Service.]

The Gap Between U.S. and South American Soybean Acreage Has Narrowed Over the Past Two Decades



U.S. Oilseed Producers Face Keen Competition

The volume of world trade in oilseeds, oils, and oilseed meal more than tripled between 1962 and 1988, rising from 23 million to 80.3 million metric tons. In addition, the number of countries participating in such trade nearly doubled, according to economist Arthur B. Mackie of USDA's Economic Research Service. Exports of oilseeds themselves grew more slowly than exports of oils or meal.

An increase in population and a need for more food and feed for livestock caused the great upswing, with the United States dominating some categories of exports. The United States met the demand for oilseed products by stepping up some exports.

More soybeans are traded worldwide than any other oilseed, and demand is on the rise. In 1988 the United States led in exports of soybeans, followed by Brazil and Argentina. The major markets for the United States have been the European Community (EC) and Japan, despite increases in imports by such East Asian countries as South Korea, Hong Kong, and Taiwan.

The United States also leads in exports of soybean oil, the fourth fastest growing oil behind rapeseed, palm, and palm kernel oils. Between 1962 and 1988 the United States and the EC were fairly equal as leaders in the trade.

According to Mackie, the markets for U.S. soybean oil are being taken over by the EC and Brazil. The EC is importing soybeans, crushing them, and exporting the oil and meal. Brazil crushed an increasingly higher proportion of its own beans and exported the oil and meal. In 1988, markets for the United States were primarily in South Asia, North Africa, and Central America.

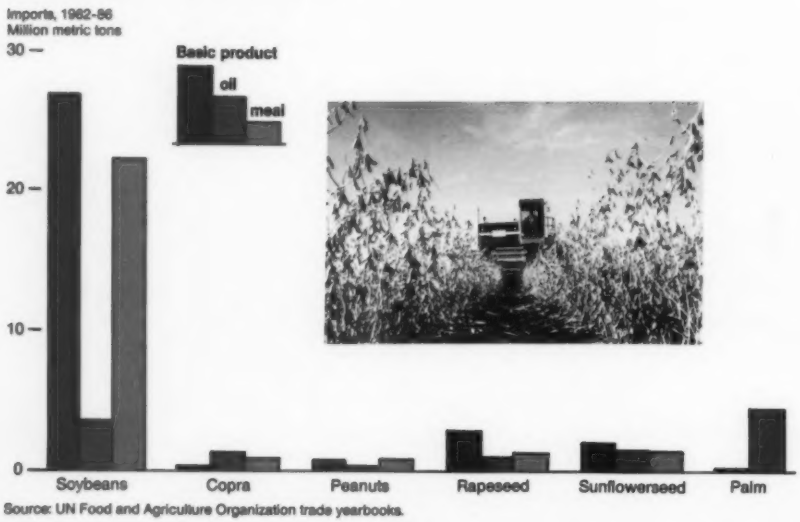
The demand for oilseed cake and meal (used as animal feed) also grew rapidly. By 1982-86 the United States had lost to Brazil the dominance it had enjoyed in 1962-66 as the leading exporter of soybean meal. "In competition with the United States," Mackie says, "Brazil underwent a deliberate program to raise its own beans, crush them, and export them as meal."

The United States was also a leader in sunflowerseed exports. In 1982-86, exports from the United States represented 47 percent of the world market. Its nearest competitor was the EC, primarily France, with 28 percent of the market. Over the past two decades, these countries gradually replaced the Soviet Union, Bulgaria, and Romania as major exporters. "When the demand for sunflowerseed and oils doubled on the world market, the Soviet Union and the countries it dominated were unable to increase production," Mackie explains. "They could not even meet their own needs."

The primary markets for the United States have been the EC, Central America, and East Asia.

The United States has gradually gained market share to become the third largest exporter of sunflower oil, behind Argentina and the EC (moving up from fifth place in 1972 to third in 1982). The markets for the United States became, increasingly, West, East, and South Asia and the EC. Other

Soybeans and Related Products Have Been the Biggest Volume Gainers in World Oilseed Trade



Source: UN Food and Agriculture Organization trade yearbooks.

World Soybean Imports, 1988

	Major exporters							
	United States	Brazil	Argentina	China	Paraguay	EC-10	Others	Total Imports
Importing regions	*1,000 metric tons*							
North America	71.0	0	0	0	0	0	59.8	130.8
EC-10	6,115.1	1,454.1	1,361.6	1.3	507.4	247.3	92.1	9,778.9
Other Western Europe	2,092.2	610.3	281.3	.3	354.9	14.0	53.8	3,406.8
Eastern Europe	1,286.5	78.2	74.3	546.9	0	0	19.0	2,004.9
Oceania	30.8	0	0	0	0	0	0	30.8
West Asia	585.5	23.4	0	0	0	11.1	86.1	706.1
Central America	1,144.9	2.0	3.0	5.5	0	0	0	1,155.4
North Africa	45.2	0	0	0	0	0	4.5	49.7
South Asia	26.7	0	0	0	0	0	.6	27.3
East Asia	6,785.8	595.9	0	394.6	205.4	0	84.8	8,066.5
Southeast Asia	178.4	13.7	120.1	493.3	0	0	130.9	936.4
Caribbean	95.8	0	0	15.0	0	0	0	110.8
South America	513.2	0	4.4	0	18.3	0	15.8	551.7
Total exports	18,971.1	2,777.6	1,844.7	1,456.9	1,086.0	272.4	547.4	26,956.1

substantial markets remained in South and Central America. Like those for sunflowerseed, the main exporters of the oil underwent radical change. The Soviet Union and Romania dropped out as world exporters, leaving Argentina and the EC in first and second positions.

The United States has not yet become a major producer of the rapid-growth commodity rapeseed, but Mackie says it is within our capability to raise it, mainly in such northern Great Plains States as Wisconsin, the Dakotas, and Minnesota. The United States is, however, constrained by its climate in producing the high-demand products derived from copra, palm nuts, and olives.

Some oilseeds the United States does grow—such as linseed, cottonseed, and peanuts—either declined in sales or registered small gains over the past two decades. □

— Carol Lee Morgan

China Cuts Imports of U.S. Farm Products

In 1991, U.S. exports to China of wheat, corn, and such minor agricultural products as inedible tallow will decline sharply, according to economist Francis Tuan of USDA's Economic Research Service. In the 1980's, wheat, corn, and cotton were the major U.S. agricultural exports to China. In the last few years, exports of cotton have remained steady. After a drop in 1990 from the previous year, cattle hide exports are expected to increase in 1991. Poultry products (mostly feathers and down) have increased.

Exports in 1991 should be significantly down from the $814 million of last year, according to Hunter Colby, another ERS economist.

China is enjoying a rich harvest, part of a long-time trend which began with agricultural reform in 1979. Production leveled off after 1984, but rose again in 1989 and expanded even further in 1990. As a result, China's imports are likely to fall. "For the past 40 years, China's goal has been food self-sufficiency," comments Tuan. In 1990 China produced 435 million tons of grain, compared with 321 million tons in 1980. In 1949, the year the Communists took over, grain production was only 113 million tons.

In 1990 China's wheat crop approached 100 million tons, the second consecutive abundant harvest. Exports from the United States are predicted to decline from the 3.7 million metric tons shipped in 1990.

Beijing boosting exports to other Asian countries.

The decline in import demand should be reduced to a degree by three factors:

- increased per capita income and a corresponding demand for fine grains (wheat and rice), as opposed to coarse grains (such as corn),
- continued population growth and a consequent decline in per capita total grain availability, despite higher production, and
- the recent 1.5-million-metric-ton Export Enhancement Program initiative for wheat extended to China by the United States.

China's record corn crop in 1990, estimated at about 90 million tons, should reduce U.S. corn exports from $15 million in 1990 to near zero. Meanwhile, China's exports to other Asian countries (notably Japan and South Korea) will increase, due at least in part to China's overburdened transportation and storage facilities, which prevent efficient shifting of produce from surplus to deficit areas.

Exports of cattle hides from the United States to China are expected to increase, following a decline from 133,000 hides in 1989 to 29,000 in 1990. Imports in 1991 may climb as high as 100,000. Shoe production has fallen off in other Asian countries as a result of high labor costs, sparking an increase in China and a growing demand for cattle hides from the United States. China will probably remain a steady customer over the next several years, at least until the quality of its hide processing operations improves, Tuan says.

Unlike other exports to China, cotton has remained relatively constant over the last 2 years, totaling 196,000 tons in 1989 and 183,000 in 1990. Meanwhile, China's 1990 cotton harvest soared to 4.47 million metric tons, from 3.8 million the previous year. Low production, high consumption, and relatively high exports during several previous years, however, depleted stocks, thus ensuring continued demand for imports, Colby explains. □

[Based on information provided by economists Francis Tuan and Hunter Colby, Agriculture and Trade Analysis Division, Economic Research Service.]

U.S. Agricultural Exports to China Dropped Sharply Last Year

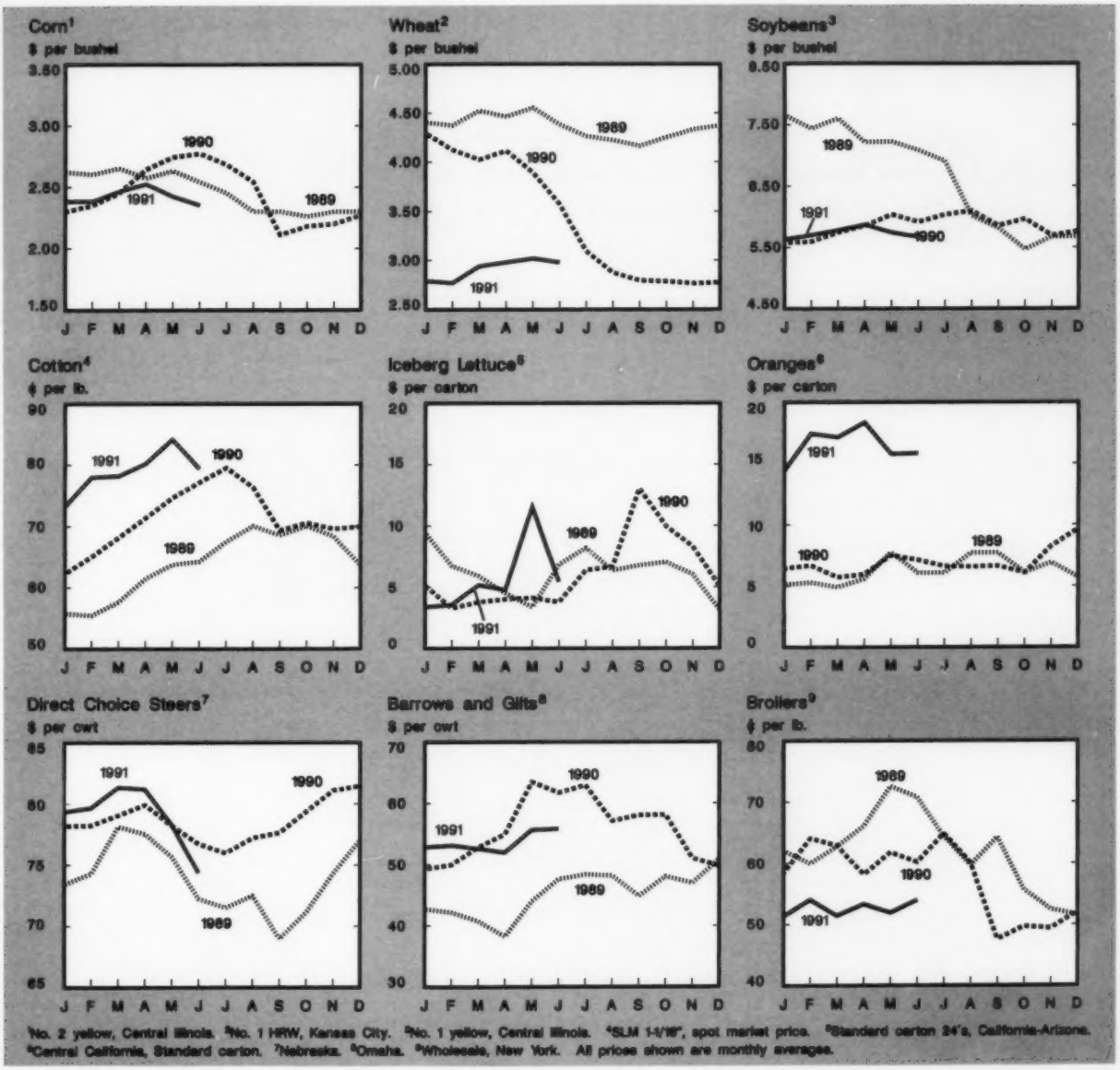
Item	1989	1990
	1,000 tons	
Wheat	7,401	3,692
Corn	302	140
Cattle hides*	133	29
Cotton	196	183
	$ million	
Wheat	1,108.7	497.3
Corn	33.5	15.0
Cattle hides	5.4	1.2
Cotton	259.1	277.2
Agricultural exports	1,435	814
Total exports	5,755	4,807

* Expressed in thousands of whole hides rather than in tons.

FARMLINE TRENDS

Monthly Price Monitor

USDA's June 1991 inflation-adjusted index of farm prices, from the National Agricultural Statistics Service's Agricultural Prices report, was 2% above May and 2% above its year-earlier level. Wholesale market prices follow. All crops shown below, with the exception of oranges, were down from May averages. Corn dropped to $2.34 per bushel, its lowest point so far this year. Wheat slipped back to its April average of $2.96 per bushel, while soybeans dropped to $5.65 per bushel. Cotton declined to 79.1¢ a pound. Iceberg lettuce, at $5.33 a carton, was down sharply from May's average of $11.41. In the meat animals area, direct choice steers at $74.25 per cwt decreased to the lowest level since October 1989. Barrows and gilts rose 20¢ to $55.64 per cwt. Broilers moved up to 53.9¢ per pound.



[1]No. 2 yellow, Central Illinois. [2]No. 1 HRW, Kansas City. [3]No. 1 yellow, Central Illinois. [4]SLM 1-1/16", spot market price. [5]Standard carton 24's, California-Arizona. [6]Central California, Standard carton. [7]Nebraska. [8]Omaha. [9]Wholesale, New York. All prices shown are monthly averages.

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